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ABSTRACT

A practicum study was conducted to raise the reading comprehension level of students at least one grade level by using Computer-Assisted Instruction (CAI), and to determine the kind of student who would most benefit by the use of CAI. A control group of 35 students and three experimental groups of 19 computer students, all in fourth or fifth grade, received normal classroom instruction in reading. The 19 students received extra computer training in reading comprehension for a period of 3 months. CAI students used original teacher-developed software entitled "Reading Comprehension" and the commercial reading program, "Our Weird and Wacky World" by Educational Activities. All students were tested before and after the use of the computers. Results of those using computers showed an increase when comparing the test scores. The overall gain of CAI students was 1.5 years. It was recommended that this program of study be extended over a 10-month school year and that the curriculum be expanded to include an adjustable program to encourage faster reading along with the increase in comprehension. (Seven appendixes containing graphs, reading sources, student opinions, and a sample parent letter are attached.) (MG)

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ED312608

READING COMPREHENSION AND THE COMPUTER

by

NANCY W. BOYER

A Practicum Report

submitted to the Faculty of the Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science.

May, 1984

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ABSTRACT

Reading Comprehension and the Computer

Boyer, Nancy W., 1984: Practicum Report, Nova University Center for the Advancement of Education

Descriptors: Computer Assisted Instruction(CAI)/ Reading/ Elementary Education..Intermediate grades/ Compensatory Education/ Learning Disabled/ Gifted/ Remedial Instruction/ Skills/ Testing/ Exceptional Education/ Computer Labs/ Reading Level Improvement

A reading comprehension software program and corresponding workbook was written by the author for 4th and 5th grade students. The purpose of the 3 month Computer Assisted Instruction(CAI) was to raise the reading comprehension of the students at least one grade level.

A control group, did not use the computer or related materials, and the CAI students were tested before and after instruction. The overall gain of CAI students was 1 year and 6 months. (Appendices show charts of the need for this study and the final increases.)

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PURPOSE

The background setting for this practicum study is a school of 800 students. In the intermediate classes of 4th and 5th grades, an intense effort has been made to raise the scores in language arts and math. Appendices A, B, and C show the specific areas of weaknesses.

In preparing for this practicum study, reading comprehension was selected. Since the ability to read and understand is the key to most learning, the goal was to increase the reading level of each student by at least one grade level. This was to be done by using the computer as a learning tool. Computer Assisted Instruction has gained in popularity throughout the country. Studies have shown that students have made great strides in different areas of learning by use of the computer (see RESEARCH section of this paper).

In comparing the SSAT (Student State Assessment Test) scores for the years 1981,1982, and 1983, there was a particular decline in reading skill C. This skill is determining word meanings from word parts, such as the root word or the prefix or suffix of a word. (See Appendix A) In this same period, there was also a drop in the ability to determine generalization supported by a message.

As Appendix A shows, there was a decline of 27 points between 1981 and 1982 in the area of finding the main idea in reading. The administration was concerned about these drops and began instruction to teachers to remediate these weaker areas during the months following the summer vacation. This is a time when students often lose some of their reading skills and retention is low because of the lapse of instructional time. A goal was set by the administration to increase the scores of students before the next SSAT testing period.

The CTBS(California Test of Basic Skills) test is another instrument that the administration used to show improvement in the reading scores. During the 1983-84 school year, the plans for improvement was to improve 5th grade total reading from 5.4 to 5.5 reading level. It was this writers opinion that this was too low. With intensive teaching in the area, plus the use of computer assistance, the level would be higher. This fact proved to be true when the 1983-84 CTBS test scores were reviewed (See Appendix F).

An additional purpose of the study was not to merely raise grade levels, but to ascertain the kind of student who would most benefit by the use of the computer assisted training. The research section of this paper is heavy on the compensatory student, and the results found by their use of the computer. There is less material available concerning the special student: such as the gifted or the auditory impaired. This paper shows some interesting results on the scores of the 100+ IQ student (See the RESULTS and RECOMMENDATION sections of this paper).

RESEARCH

In searching other studies that implemented the use of the computer as a teaching tool, it became evident that this had been done successfully over a period of years and under various circumstances.

Kathleen Adkins and Marlene Hamilton developed a teacher's handbook for computers and reading as early as 1972.[1] Their goals were to familiarize students with commonly encountered word structures, vocabulary, and sentence construction, as well as literal and interpretive comprehension. Their CAI (Computer Assisted Instruction) consisted of five lesson area:

1. Word Analysis
2. Development of study skills
3. Vocabulary extension
4. Comprehension of sentence structure
5. Interpretation of written material

Development and Use of the Micro-Computer Reader Programs, written by Maribeth Henney(1982), shows that CAI is not to be used as a time filler, but as an intregal part of study and instruction. This program, developed on a 5th/6th grade reading level, used the computer in three basic ways:

1. For reinforcement after a lesson
2. As a teaching lesson in itself
3. As a lesson before instruction by the teacher

In this study, the lesson gave immediate feedback to the student on right or wrong answers. This reinforced the student's knowledge before the subject matter was forgotten, as so often happens in the conventional setting of study.

John Henry Martin(1983) has written a document entitled Freeport Public Schools Experiment on Early Reading Using the Edison Responsive Environment Instrument (N. Y.). The objectives of this study were to take minority children, who had been newly transferred into an intergrated environment and some of whom had slight mental retardation, and study the results of using a computerized typewriter to raise their reading comprehension ability. Mr. Martin writes that a statistical analysis was made by Dr. Frederick Matthews, showing the reading program to be highly successful. The mean of the experimental scores exceeded 90% of those achieved by the control group.[3]

Another successful CAI (Computer Assisted Instruction) program was implemented in seven Chicago elementary schools in 1971. Presenting a paper to the Association for Educational Data Systems at the annual convention in New Orleans, Louisiana, George Litman (1973) showed academic gains among compensatory students. These are the students enrolled in the Chapter I program (formerly known as Title I) that is federally funded. The accomplishments of the study were:

1. Students gained in all strands of instruction.

2. During the entire program 90-100% of the students showed gain in one grade level.
3. For each month in the program, the student showed at least one month grade equivalent.
4. Extremely high gains were shown in more than 100 sessions.

The average gain for the compensatory population was 5.6 months over an 8 month period.[4]

The Los Angeles Unified School District (LAUSD) spent five years evaluating the use of computer assisted instruction. They also worked with academically weak compensatory students. Computer Assisted Instruction and Compensatory Education, written by Ragosta, Holland, and Dean (1982), shows that students using the computer only 10 minutes per day raised scores a significant amount. Increased time on the computer, therefore, brought increase in results. Teachers and administrators showed a vote of confidence to the program as student attitudes and academic progress became positive. When the government support of the program was discontinued, the Los Angeles Unified School District took up support of the CAI labs because of its contributing value to education.[5]

The above studies impress upon this writer the positive results that can be gained from the use of the computer to enhance and increase student skills in particular settings and problem areas.

METHOD

OBJECTIVE: The objective of this practicum study is to raise the reading comprehension level of the students using the Computer Assisted Instruction at least one grade level.

Plan of Action

With full approval from the administration, the plan was begun to accomplish the above objective. The Stanford Diagnostic Reading Test (Form A) was given. This test covered literal and inferential meaning. A control group of 35 students and 19 computer students were all tested. Both groups received normal classroom instruction in reading, but the CAI (Computer Assisted Instruction) students received extra computer training in reading comprehension starting February 27, 1984 until May 28, 1984. This is a period of three months.

After the CAI training was completed, once again the two groups were retested by using Form A of the Stanford Diagnostic Reading Test. The original plans were to use Form B, but the DIFFICULTIES section of this report explains why Form A was used again after the three months of training.

Materials Developed

An original software program entitled, Reading Comprehension, was programmed by this writer. Colorful graphics were used to introduce the following topics:

1. Literal Comprehension
2. Inferred Meaning
3. Main Idea
4. Supporting Details
5. Fact and Opinion
6. Predicting Outcomes

Following each story or text selection, an immediate feedback is given to the student by a flashing notice telling him whether he is correct. If an answer is incorrect, the right answer is given. Whenever the student is finished, he may find his percentage correct and is asked if he would like to review any of the selections.

An original workbook was also written to accompany the Reading Comprehension program. The topics of study in the workbook are the same as the software, but different stories are given. The student bubbles in a correct answer on a Scantron sheet, which is immediately graded on the Scantron machine, giving the number of answers correct.

Besides the original software and workbook, the CAI students used a commercial reading program, entitled Our Weird and Wacky World by Educational Activities. This program focused on:

1. Critical Reading Skills
2. Animated graphics
3. High interest stories

Immediate scoring and feedback were also given on this program, along with extra work sheet activities. The titles and description of these are:

1. Take Me Out To The Ball Game
   Research and Compound words
2. Beware of Attack Rabbit
   Capitalizing and Abbreviations
3. A Mile Wide Pie
   Smallest to largest and reading numbers
4. A Pet That's Hard to Pat
   Time categories and decoding
5. A Sneaky Snake
   Decoding and capitalizing
6. The Moscow Circus
   Categorizing and descriptive sound (alliteration)
7. Just Rolling Along
   Following directions and tricky spellings
8. Smile For a Picture
   Reading clues and decoding

Training and Orientation

The students who were to work on the CAI material were given an attractive designed and typed workbook of his own that included the original Reading Comprehension, the work sheets for Our Weird and Wacky World, and the record sheets for both. The importance of keeping a correctly recorded score page was stressed.

Before using the computers, each student was shown the basic procedures of using a diskette and its care. With each program used, little typing was required. However, finger positions and typing keys, space bar, and return key were explained. As mentioned, the workbook and record keeping sheets were an important part of the instruction. The computer gave scores that the student quickly recorded. Each student accomplished these instructions rapidly and did not require instruction of basic cooputer use thereafter.

General Procedures

Three CAI groups were formed. These consisted of 7 fifth grade students in two groups, and 5 fourth grade students in another group. Each group worked on the computer 35 minutes each week totaling 7 hours of hands on computer time. On alternate days, all students worked 35 minutes in the accompanying workbook.

Computer time, plus workbook time, gave each student 14 hours of extra reading comprehension experience.

Testing before and after the use of the computers was done in a controlled manner. All students, whether CAI or in the control group, which did not have computer instruction, were tested under the same conditions.

Difficulties

The unforeseen difficulties that arose during this study are of major and minor proportion. These are listed below:

1. The major difficulty involved the concentration ability of the students during their final testing. An emergency situation occurred with a missing student. The school office called to the room asking for information, and a police officer in uniform came to the classroom while the students were testing. These interruptions were so dramatic that the test scores of most all students were affected. After consulting with the administration and the guidance counselor, it was decided that the scores of Form B on the Stanford Diagnostic Reading test were invalid. Form A of the same test had been given three months prior to the computer training, and enough time had lapsed to give Form A again, comparing the two scores.

2. A commercial software program, Reading Comprehension by Eduware, was ordered. The program required a 16-K card that the computers did not have. These were ordered, but did not arrive during the time of implementation.

3. Make up times for the computer groups had to be arranged because of other school activities that had not been previously scheduled. Absentee problems of CAI students also called for individual make up time.

4. One CAI student transferred to another school.

Parent Involvement

Parents were written to explain the purpose of their child being involved in Computer Assisted Instruction. Written permission was acquired to test each child for his reading level ability. After the implementation was complete and the results of the practicum study were analyzed, parents were again written of their child's progress. (See Appendix G) A number of parents who are interested in helping their slow reader or the continuing growth of their average or gifted child expressed interest in the outcomes of the computer study.

RESULTS

The results of this practicum study have been positive. After the computer instruction, the students showed an increase when comparing the before and after test scores (See Appendix D). The last test, giving overall progress, was Form A of the Stanford Diagnostic Reading Test in the area of reading comprehension.[6] Two areas were tested: literal and inferential divisions. There was a period of three months between the two tests. Intensive study on the computer and the related reading materials brought about the following results:

1. Of the 19 students using the computer, 17 increased their reading grade level by more than one year, with the exception of two students. One of these stayed the same, while the other increased 7 months.

2. The 5th grade CAI students increased 1 year and 7 months.

3. The 4th grade CAI students increased exactly 1 year.
4. The overall increase of both grades showed the computer group increased 5 months more than the control group, who did not use the computers.

5. The 5th grade CAI students increased 9 months over the control group; whereas, the control group in the 4th grade increased 4 months over the CAI students.

In comparing the increases of reading levels to the student's I Q (Intelligence Quotient)[7], the study showed the following results:

1. The CAI students with an IQ of 110+ increased 2 years and 5 months.

2. The 100-90 range IQ students increased 1 year and 5 months.

3. In the below 89 IQ, the computer group increased 1 year and 4 months, as compared to the 5 month increase of the control group.

The gifted or above average student gained an entire year over the other students. This writer's observation was that the gifted child and the SLD student showed great concentration in the computer programs. The student with the lower IQ became restless if answers were missed. With all the students, the interaction with the computer was attention absorbing. The students were observed clapping their hands, or showing facial expressions of excitement, whenever the immediate feedback was positive.

RECOMMENDATIONS

The following recommendations are made for future use of computer assisted instruction in the area of reading comprehension:

Length of Study

It is this writer's opinion that three months is not sufficient amount of time for the student to reach his full growth potential in reading comprehenson. Even though the results were good (excellent in some students), it is recommended that this program of study be extended over a school year (10 months). During this period of time, the curriculum should also be expanded. This will be discussed in the following section.

Curriculum

The original workbook and software, Reading Comprehension, and Our Weird and Wacky World consumed all the time that was available in the three month period. However, over a longer time, other software programs could be used. It would be extremely beneficial to use an adjustable program to encourage faster reading along with the increase in comprehension.

Student Groups

1. Gifted: The results section showed great increase in the student with 100+ IQ. This indicated that this category of student would greatly benefit by the use of a computer instructed study session. It is recommended that the gifted class have a computer in their room, if at all possible, and work as an independent study on the program.

2. Special students: The observation was made with the SLD (Special Learning Disabled) student that concentration was at a maximum during the study. In a regular classroom setting, this student is highly distracted and often does not accomplish his task. SLD students should be allowed to use the computer on an individual basis as often as possible to help in those areas where he is disabled.

   It is also recommended that the auditory handicapped be given computer reading comprehension. Since most of the computer programs are primarily visual, the dependence on learning from hearing is less.

   Most of the research for this practicum was relating to the compensatory child. The compensatory student did increase in the study, but it would be advised to give them short , but freguent times at the computers because of lack of real concentration after 20 minutes.

Follow on with Reading Comprehension and the Computer

1. A letter will be written to the Diretor of Elementary Education, Coordinator of Reading, and Director of Media Services showing the results of this study. Recommendations will be made that the original work book and reading comprehension software be made available to all elementary schools in the county.

2. Further, a grant will be written asking the state to fund the publishing of the same original material to find the results on an extended year study throughout the area of central Florida.

3..Another similar study will be written by the writer in the areas of word problems in math, teaching students how to read word problems , deciding what operation is to be used, and correctly finding the answer.

4. A training session will be given to instruct teachers how to use the program and related materials.

5. Parents have expressed interest in the reading study. One parent wrote asking if she could have further information on the study because she had a child in another grade that needed special help.[8] A parent session will be held giving information on commercial software that is available for use on home computers in the area of reading comprehension.

FOOTNOTES

[1] Adkins, Kathleen & Hamilton, Marlene (1972). Teacher's Handbook for Reading. Computer Corporation: Pala Alto, CA.

[2] Henney, Maribeth (1982). Development and Use of Microcomputer Reader Program. Presented at the Iowa Council of the International Reading Association. Des Moines, IA.

[3] Martin, John Henry (1983). Freeport Public Schools Experiment on Early Reading Using the Edison REsponsive Environment Instrument. Responsive Environments Corporation: New York, N.Y.

[4] Litman, George H. (1973). CAI in Chicago. Paper presented at the Association for Educational Data System: New Orleans, Lousiana.

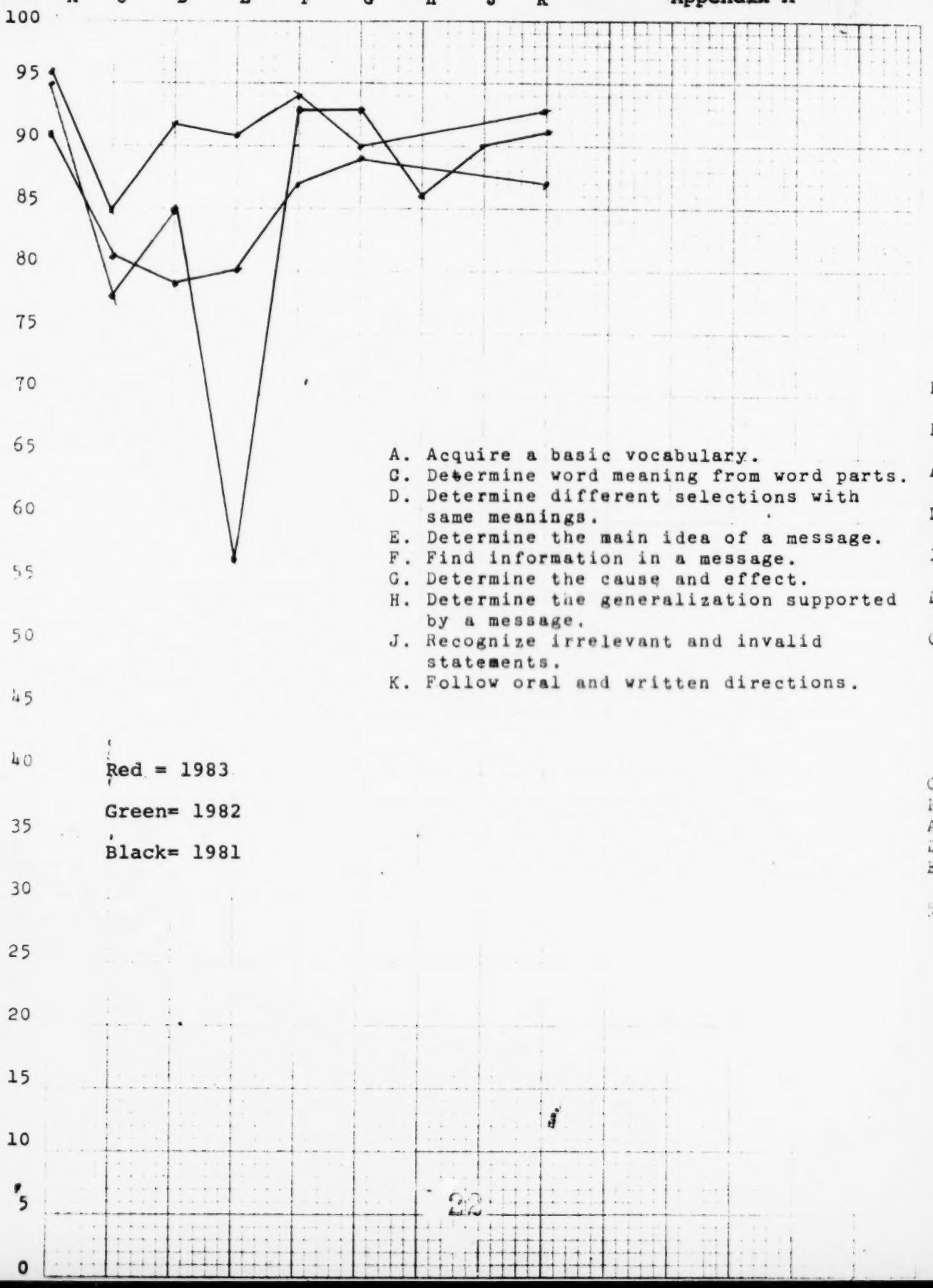
[5] Ragosta, Marjorie, Holland, Paul W. & Famison, Dean L. (1982). Computer Assisted Instruction and Compensatory Education. The ETS/LAUSD study). Educational Testing Service: Princeton, N.J.

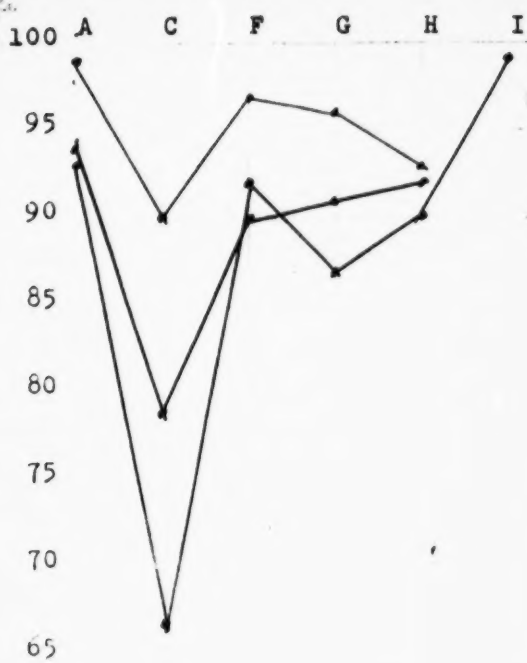
[6] Stanford Diagnostic Test (Form A). Testing results.

[7] California Test of Basic Skills. IQ scores.

[8] Parent letters. Return comment.

Appendix A


A C D E F G H J K
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
A. Acquire a basic vocabulary.
C. Determine word meaning from word parts.
D. Determine different selections with same meanings.
E. Determine the main idea of a message.
F. Find information in a message.
G. Determine the cause and effect.
H. Determine the generalization supported by a message.
J. Recognize irrelevant and invalid statements.
K. Follow oral and written directions.
Red = 1983
Green= 1982
Black= 1981
READING
GRADE 5



A..Compose grammatically correct sentences.
C..Write a paragraph.
F..Fill out common forms.
G..Spell correctly
H..Punctuate correctly.
I..Capitalize correctly.

Red= 1983

Green = 1982

Black= 1981

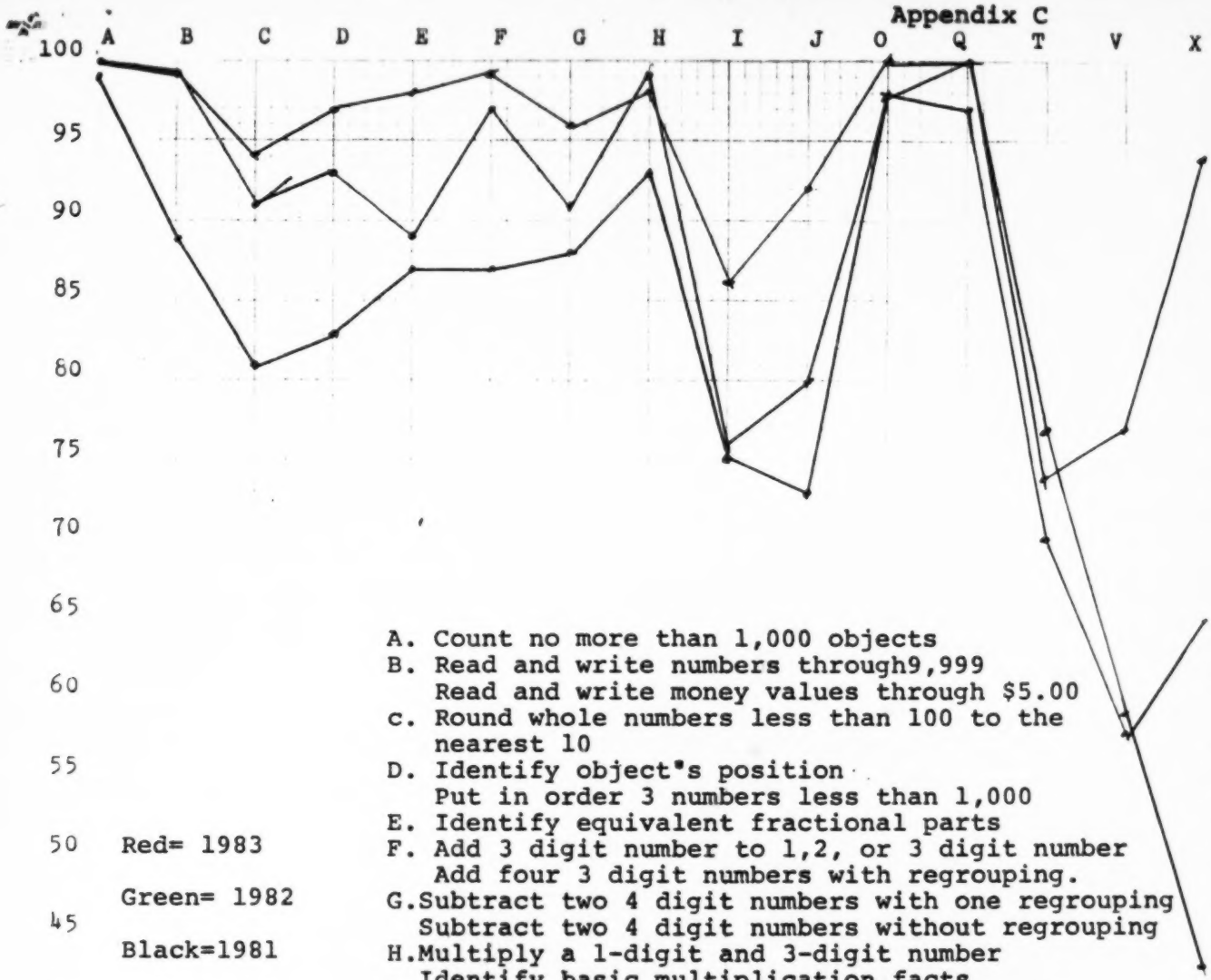
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

W
R
I
T
I
N
G

G
R
A
D
E

5

(0 Squares to the Inch

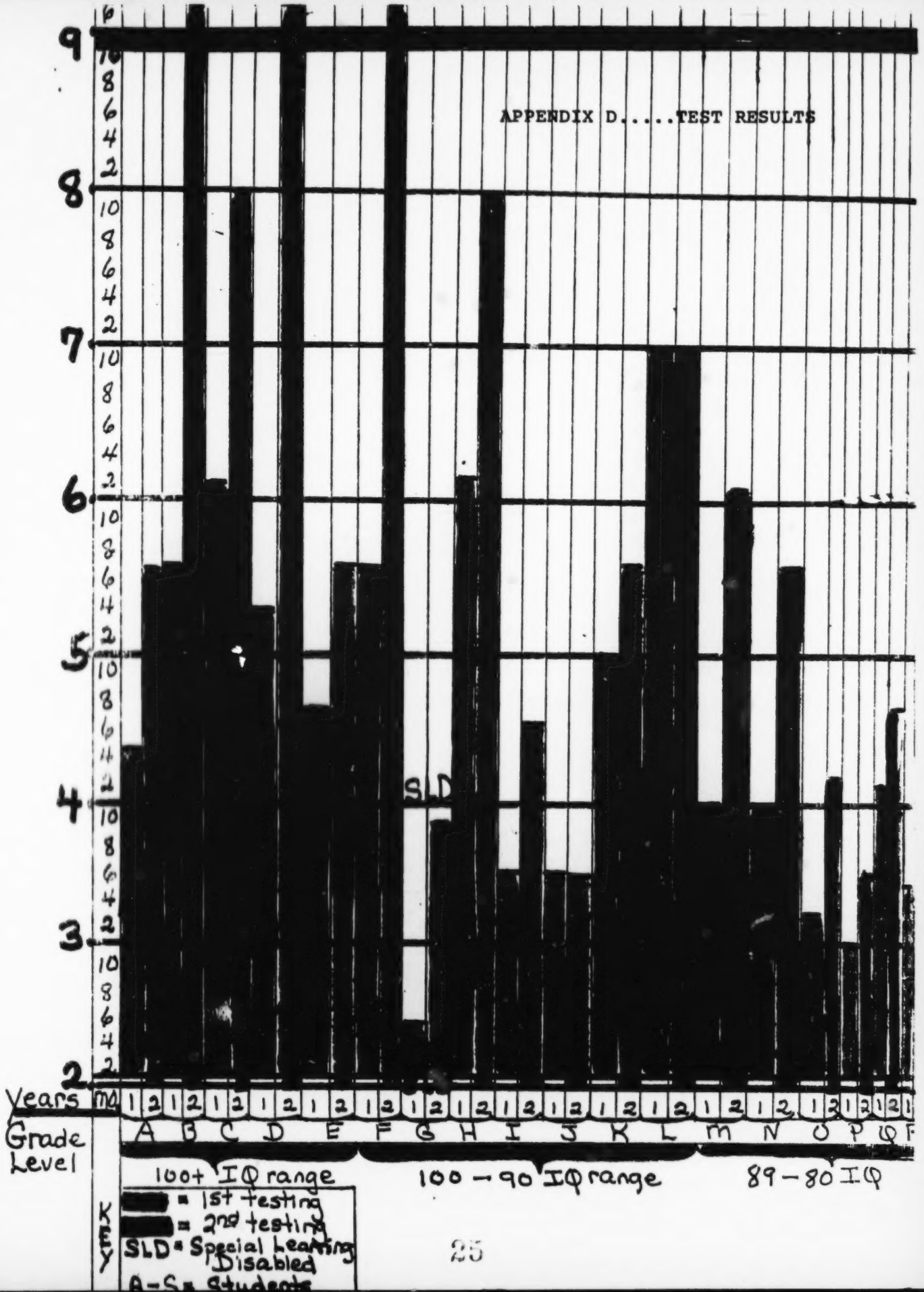


Red= 1983

Green= 1982

Black=1981

A. Count no more than 1,000 objects
B. Read and write numbers through9,999
Read and write money values through $5.00
c. Round whole numbers less than 100 to the nearest 10
D. Identify object's position
Put in order 3 numbers less than 1,000
E. Identify equivalent fractional parts
F. Add 3 digit number to 1,2, or 3 digit number
Add four 3 digit numbers with regrouping.
G. Subtract two 4 digit numbers with one regrouping
Subtract two 4 digit numbers without regrouping
H. Multiply a 1-digit and 3-digit number
Identify basic multiplication facts
I. Divide 3-digit number by 1- digit number
Multiply a 1-digit and 3 digit number
J. Subtract 2 proper fractions with like denominator
Add two proper fractions with like denominator
O. Tell time on the hour, half-hour, and quarter hr.
Measure length, width, and height using centimeters or meters.
Identify months of the year in order.
Q. Identify equivalent amounts of money up to $5.00
T. Solve word problems by adding three 3 digit numbers.
Solve word problems subtracting two 3-digit numbers.
V. Solve purchase problems to involve change from $1.00
X Find information in bar graphs or pictographs.


9
8
7
6
5
4
3
2
SLD
Years
Grade Level
A B C D E F G H I J K L m N O P Q R
100+ IQ range
100 – 90 IQ range
89 – 80 IQ
KEY
= 1st testing
= 2nd testing
SLD = Special Learning Disabled
A-S = Students

APPENDIX E

STUDENT OPINIONS AND REACTIONS

Most of the students expressed the opinion that the reading comprehension programs were helpful in teaching them to read better. They generally felt the stories were too short, with not enough action, but enjoyed the graphics in particular. Here are a few of their candid comments given in a survey:

1. " It showed me how to get the main idea about things. I liked the fact and opinion."

2. " I liked everything about the graphics. They were creative."

3. " I liked all the neat designs. I disliked it because it was bright on your eyes."

4. " It helped me on my reading alot , at least I think so. I learned more about how to read a story. It helped me more about main idea."

5." It was teaching me something I did not know."

6. " I liked them(graphics) because they were neat looking."

7. "It made me smarter."

8. " It benefited me because it was easy. I could do it in a snap."

9. "It helped me on my reading skills."

10. "I didn't like the stories. They didn't have any action."

11. " I liked the animal stories like the Rat."

12. " My reading scores really went up thanks to that computer program , Reading Comprehension."

APPENDIX F.....CTBS READING SCORES

ADMINISTRATORS SUMMARY OF TEST DATA MEAN VALUES

...TY SCHOOL DISTRICT

TESTING

GRADE 05.8
FORM T, LEVEL 2
05/23/84

RS = MEAN RAW SCORE
MNESS = MEAN OF EXPANDED SCALE SCORES (ES
MAASS = MEAN OF ANTICIPATED ACHIEVEMENT S
MDIFF = MEAN OF DIFFERENCES (ESS - AASS)
SGE = GRADE EQUIVALENT OF MEAN OF EXPA
SAAGE = GE OF MEAN OF ANTICIPATED ACHIEV
SDIFF = DIFFERENCE OF (SGE - SAAGE)
N = CASE COUNT PER SECTION

...T FORM TEST OF ACADEMIC APTITUDE

COMPREHENSIVE TESTS OF BASIC SKILLS

NO. CASES	CA	L IQ	NL IQ	TOTL IQ		READ VOC	READ COMP	READ TOTL	LANG MECH	LANG EXP	LANG SPL	LANG TOTL	MATH COMP	MATH CON	MATH APL	MATH TOTL	
					RS	30.0	29.0	59.0	14.0	24.0	39.0	78.0	36.0	17.0	17.0	71.0	2
					MNESS	486.5	516.0	494.4	516.9	517.3	495.1	494.5	470.0	492.0	484.4	474.4	4
132	11-03	102	105	104	MAASS	489.7	509.2	491.2	512.8	525.0	497.3	497.6	455.4	471.0	478.8	458.6	4
(INVALID CASES				1)	MDIFF	-3.1	6.8	3.2	-2.2	4.0	-7.7	-3.1	14.5	21.0	5.5	15.7	
					SGE	6.7	7.4	7.0	7.9	7.2	6.8	7.0	7.0	7.4	6.9	6.9	
					SAAGE	6.8	7.1	6.9	7.6	7.6	6.9	7.2	6.4	6.7	6.7	6.5	
					SDIFF	-0.1	0.3	0.1	0.3	-0.4	-0.1	-0.2	0.6	0.7	0.2	0.4	
					N	132	132	132	132	132	132	132	132	132	130	130	
28	I.Q. 115 AND ABOVE				RS	36.0	37.0	73.0	16.0	28.0	43.0	88.0	40.0	20.0	21.0	81.0	2
					MNESS	562.6	606.6	577.9	557.2	576.8	538.0	545.4	498.8	549.4	541.5	523.2	5
					MAASS	565.2	595.3	570.7	575.2	597.1	549.7	563.2	502.5	539.7	554.5	520.4	5
					MDIFF	-2.6	11.3	7.1	-11.7	-18.0	-20.3	-17.8	-3.6	9.6	-13.0	2.8	
					SGE	9.0	10.4	9.8	10.0	10.0	8.8	9.7	8.0	9.0	8.9	8.7	
					SAAGE	9.1	10.2	9.7	10.7	10.5	9.4	10.1	8.2	8.8	9.4	8.6	
					SDIFF	-0.1	0.2	0.1	-0.7	-0.5	-0.6	-0.4	-0.2	0.2	-0.5	0.1	
32	I.Q. 96 TO 104				RS	31.0	28.0	59.0	14.0	24.0	39.0	77.0	38.0	18.0	17.0	73.0	2
					MNESS	477.5	501.1	482.4	512.3	511.6	489.2	488.4	478.8	496.4	483.4	476.9	4
					MAASS	470.9	488.7	472.1	500.1	509.2	485.5	483.3	447.6	458.3	463.7	446.1	4
					MDIFF	6.6	12.3	10.2	3.6	12.1	2.4	5.0	31.2	38.0	19.7	30.7	
					SGE	6.4	6.8	6.5	7.6	6.9	6.5	6.7	7.3	7.6	6.9	7.0	
					SAAGE	6.2	6.1	6.1	6.7	6.7	6.4	6.4	6.2	6.2	6.2	6.0	
					SDIFF	0.2	0.7	0.4	0.9	0.2	0.1	0.3	1.1	1.4	0.7	1.0	
9	I.Q. 95 AND BELOW				RS	23.0	19.0	42.0	9.0	16.0	33.0	59.0	26.0	13.0	10.0	50.0	
					MNESS	408.1	416.8	410.7	416.2	431.2	433.4	413.4	400.4	409.3	386.3	400.1	
					MAASS	397.0	402.2	392.0	428.0	432.6	425.4	410.7	387.7	379.8	374.2	375.7	
					MDIFF	11.1	14.6	18.7	8.0	-11.7	-1.4	2.6	12.6	29.4	12.1	24.3	
					SGE	4.5	4.0	4.4	3.5	3.5	4.3	3.8	4.8	4.5	3.9	4.8	
					SAAGE	4.2	3.7	4.0	3.7	3.5	3.9	3.7	4.6	3.7	3.7	4.1	
					SDIFF	0.3	0.3	0.4	-0.2	0.0	0.4	0.1	0.2	0.8	0.2	0.7	

NOTE: ALL GRADE EQUIVALENT STATISTICS WERE OBTAINED BY COMPUTING MEANS OR STANDARD DEVIATIONS IN SCALE

APPENDIX G

SAMPLE PARENT LETTER

June 3, 1984

Dear Parents,

Approximately three months ago, your child was tested for his or her reading comprehension grade level. He was placed in a Computer Assisted Instruction(CAI) group, or in the control group that did not have extra computer reading lessons. The purpose of this study was to see if using the computer made a difference. The cooperation of the students was outstanding. They used an original reading software and workbook that I have written, as well as some commercial software. I am pleased to give to you the following results:

1. Each computer student gained a grade level or more with the exception of 2 students. One of these stayed the same, and the other gained 7 months.

2. The CAI students gained 1 year 6 months, whereas the control group gained 1 year and 1 month.

These groups were from a wide variety of IQ ranges, and the results show that the students did benefit by use of the computer.

At the bottom of this letter, I will show you what increase, if any , your student had and in which group he participated. I am proud of all the students, and would like to wish them and you an especially nice summer.

Sincerely,

Student.....Group: Computer.....or Control.....

Reading increase.....year.....months